

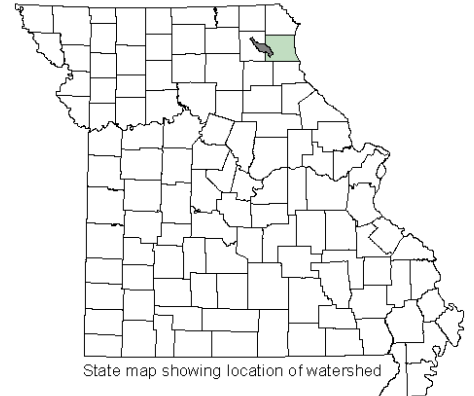
Missouri Department of Natural Resources

Total Maximum Daily Load Information Sheet

La Belle Lakes #1 and #2

Waterbody Segment at a Glance:

County: Lewis
Nearby Cities: La Belle
Area Impaired, Lake #1: None
Area Impaired, Lake #2: 112 acres
Pollutant: Atrazine, Cyanazine
Source: Corn, sorghum production



State map showing location of watershed

Note: Long term average Atrazine levels in La Belle Lake #1 now meet state water quality standards, therefore, this lake has been deleted from the 2002 303(d) List. Cyanazine and Mercury were added as pollutants to the 2002 303(d) List for La Belle Lake #2. A separate information sheet discusses Mercury impairment in Missouri waters.

TMDL Priority Ranking: High—La Belle Lake #2

Description of the Problem

Beneficial uses of La Belle Lakes #1 and #2

- Livestock and Wildlife Watering
- Protection of Warm Water Aquatic Life
- Protection of Human Health associated with Fish Consumption
- Boating and Canoeing
- Drinking Water Supply

Use that is impaired

- Drinking Water Supply

Standards that apply:

- Missouri's Water Quality Standards 10 CSR 20-7.031, Table A, allows a maximum of three micrograms per liter ($\mu\text{g/L}$) atrazine. Because this number is based on health risk associated with a 70 year exposure period, the three $\mu\text{g/L}$ is interpreted as a long term average.
- A federal health advisory level of one microgram per liter ($\mu\text{g/L}$) cyanazine is recommended for drinking water supplies.

Background Information and Water Quality Data

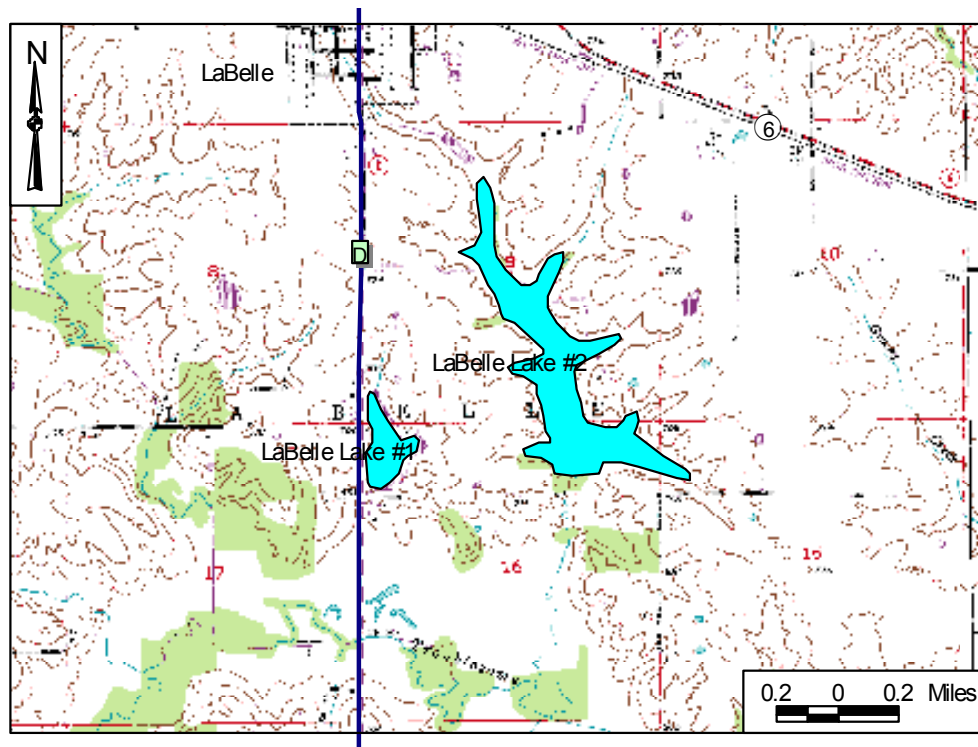
The two La Belle Reservoirs total 129 acres in size and previously served as the public water supply source for about 850 people in La Belle, and also supplied water to Knox County Public Water Supply District No.1. The City of La Belle and Knox County PWSD No.1 now obtain all their drinking water from the Clarence Cannon Wholesale Water Commission and no longer use La Belle Reservoirs for their water supply.

Runoff from corn and sorghum production areas in the watershed has resulted in measurable amounts of atrazine being detected within these lakes. Atrazine is a widely used herbicide for control of broadleaf weeds. It is the most heavily used herbicide on corn and grain sorghum in Missouri. Since 1993, its use has been greatly restricted. Atrazine is considered a possible human carcinogen, so the state standard for allowable amounts in drinking water supply source waters is set at 3 µg/L or parts per billion. The long term atrazine average in Lake #1 is now only 0.77 µg/L and this lake was deleted from the 2002 303(d) list. Lake #2 now has a long term average atrazine level of 3.42 µg/L.

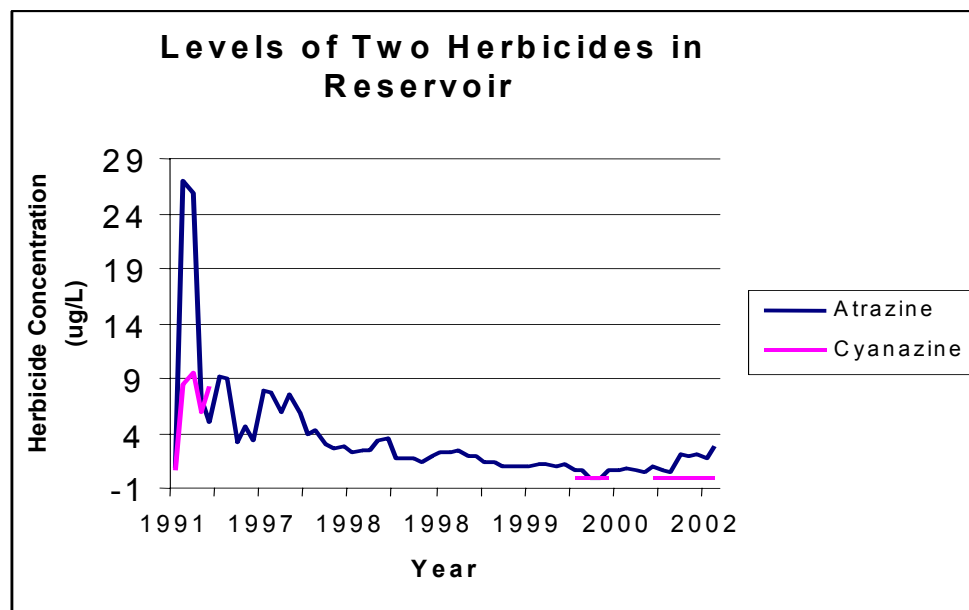
Cyanazine is an agricultural herbicide that was used from 1971 to 1999, when its manufacturer voluntarily withdrew it from production. At one time it was the fourth most widely used synthetic chemical pesticide in U.S. agriculture, applied to corn, cotton, and sorghum crops to control broadleaf weeds. It is relatively persistent in the environment, and under certain conditions will remain at significant levels in surface water for over one year. It has been identified as a surface water contaminant in 30 states, including Missouri. Cyanazine was withdrawn from use after being linked to a range of adverse health effects, including respiratory distress, cerebral palsy and impaired fetal development. La Belle Lake No.2 has a long-term average Cyanazine level of 1.82 µg/L.

The Department of Natural Resources has terminated monitoring of raw water from these two lakes since they no longer serve as drinking water supply sources.

Map of La Belle Lakes #1 and #2



The following graph and charts summarize the existing data for Lakes No. 1 and 2.



**Atrazine Concentrations in La Belle Lake #1
(µg/L)**

August, 1999	0.71
December, 1999	0.51
March, 2000	0
June, 2000	0
September, 2000	0

Source: Missouri Department of Natural Resources

**Atrazine Concentrations in La Belle Lake #2
(µg/L)**

June, 1992	9.0
September, 1992	9.2
December, 1992	4.7
March, 1993	3.4
June, 1993	3.1
August, 1999	0.62
December, 1999	0.62
March, 2000	0
June, 2000	0
September, 2000	0.57

Source: Missouri Department of Natural Resources

**Average Yearly Atrazine Concentrations in La Belle Lake #2
(µg/L)**

1996 (August – November)	7.33
1997 (January – November)	3.32
1998 (January – November)	1.90
1999 (January – December)	1.00

Source: Novartis Inc. (now Syngenta)

**Average Monthly Atrazine Concentrations in La Belle Lake #2
(µg/L)**

January (1997-1999)	3.07
February (1997-1999)	2.27
March (1997-1999)	2.33
April (1997-1999)	1.80
May (1997-1999)	1.87
June (1997-1999)	2.07
July (1997-1999)	1.90
August (1996-1999)	3.45
September (1996-1999)	3.35
October (1996-1999)	2.95
November (1996-1999)	3.28
December (1999)	0.70

Source: Novartis Inc. (now Syngenta)

**Atrazine Concentrations in La Belle Lake #2, 1991
(µg/L)**

March	0.85
June	26
June	27
November	5
November	7.2

Source: University of Missouri

For more information call or write:

Missouri Department of Natural Resources

Water Protection Program

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